

# Treatment of Cutaneous Hemangiomas in Preterm Neonatal Twins With the Flashlamp-Pumped Pulsed Dye Laser

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**Background and Objective:** We report two cases of hemangiomas in twins born at a gestational age of 30 weeks who were treated with a flashlamp-pumped pulsed dye laser (FPDL) at 40 days postpartum. These were the youngest patients to our knowledge to be treated with FPDL.

**Study Design/Patients and Methods:** Twin Caucasian females were born 10 weeks preterm. Twin A soon developed a 1 cm blanching erythematous patch with telangiectasia on a slightly bulbous nasal tip. Twin B developed a 6 mm erythematous papule on her forehead, a 12 × 10 cm erythematous plaque on her left shoulder, and two plaques measuring 2.5 × 2.0 cm and 1.5 × 1.0 cm on her right hip. The twins received seven monthly laser treatments.

**Results:** Several of the hemangiomas showed remarkable regression, including the lesions which became ulcerated and healed on Twin B's left shoulder and right hip. No general or topical anesthesia was used and the twins tolerated the procedure well. No significant adverse effects were encountered. The maximum single treatment dose was 7 mm spot size, 5.0 J/cm<sup>2</sup> and 186 pulses for twin B and 6.25 J/cm<sup>2</sup> and 16 pulses for twin A.

**Conclusion:** To our knowledge, our patients are the youngest reported to be treated with FPDL at age 30 days preterm. Some of their hemangiomas responded, and no significant adverse effects were encountered. More prospective trials are needed to determine whether early treatment with FPDL accelerates regression of hemangiomas or results in a better cosmetic outcome than expectant treatment. *Lasers Surg. Med.* 22:10-13, 1998. © 1998 Wiley-Liss, Inc.<sup>†</sup>

**Key words:** involution; regression; ulcerated hemangioma; nasal hemangioma; youngest

## INTRODUCTION: TREATING CUTANEOUS VASCULAR LESIONS

Flashlamp-pumped pulsed dye lasers (FPDL) are used in the treatment of cutaneous vascular lesions such as hemangiomas and vascular malformations. The earliest reported age that a neonate was treated with a pulsed dye laser is 2 weeks old [1]. Recent studies show an increased incidence of hemangiomas in premature infants [2]. Although there have been some reports that a better cosmetic outcome may result when involu-

tion is complete at an earlier age [3], treatment with the pulsed dye laser will not necessarily change the ultimate outcome. We report two cases of hemangiomas in twins born at a gestational age of 30 weeks who were treated with a pulsed dye laser at 40 days postpartum. These were the youngest patients to our knowledge to be treated with FPDL.

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Fig. 1. Twin B's 12 × 10 cm hemangioma on the left shoulder before treatment at age 36 days postpartum (34 days preterm).



Fig. 2. Twin B's hemangioma on the left shoulder after five monthly FPDL treatments showing regression and residual fibrofatty changes.

## MATERIALS AND METHODS

Twin Caucasian females were born 10 weeks preterm. Both twins had low birth weights and twin B had infrequent apnea and bradycardia, but were otherwise healthy. At approximately age 1 week postpartum, twin A developed an erythematous blanching macule on the nasal tip and twin B developed four erythematous blanching macules on her forehead, shoulder, and hip. At age 36 days postpartum, the dermatology service was consulted.

Physical exam of twin A revealed a 1 cm blanching erythematous patch with telangiectasia on a slightly bulbous nasal tip. She had no respiratory distress. Her weight was 2.52 kg. Twin B weighed 2.01 kg and had continued to experience infrequent apnea and bradycardia. She was maintained in an incubator. She had a 6 mm erythematous papule on her forehead, a 12 × 10 cm erythematous plaque on her left shoulder (Fig. 1), and two plaques measuring 2.5 × 2.0 cm and 1.5 × 1.0 cm on her right hip. Twin B's hemangiomas covered ~5% of her body surface area and had noticeably proliferated from erythematous patches noted soon after birth.

At age 40 days postpartum, the twins' hemangiomas were treated with a FPD (SPTL-1B, Candela Corp., Wayland, MA). No anesthesia was used. The twins were premedicated with acetaminophen. Eye protection was achieved by taping their eyelids shut. A 7 mm spot size and a 4.5 J/cm<sup>2</sup> energy density were used. Twin A received a total of 11 pulses to her nasal tip. Twin B received a total of 103 pulses to her four hemangiomas. Twin B did not experience an increase in

her infrequent apnea and bradycardia during or after treatment. Wound care consisted of cool compresses and white petrolatum twice daily. The twins did well posttreatment. Twin B developed a 5 mm vesicle on the left shoulder, which soon resolved.

## RESULTS

The twins received monthly laser treatments, and several of the hemangiomas showed remarkable regression, including the lesions which became ulcerated and healed on Twin B's left shoulder (Fig. 2) and right hip. No general or topical anesthesia was used and the twins tolerated the procedure well. No serious adverse effects were encountered. Twin B did develop some vesicles posttreatment on her shoulder, which resolved with local wound care. The blistering was most likely a result of laser treatment. Twin A had no signs of respiratory distress secondary to her nasal tip hemangioma during the 7-month course of treatment. Her nasal tip hemangioma had both a superficial and deep component and was treated with FPD for the superficial component, but continued to proliferate. We treated the twins monthly for a total of seven treatments with a maximum single treatment dose of 7 mm spot size, 5.0 J/cm<sup>2</sup> and 186 pulses for twin B and 6.25 J/cm<sup>2</sup> and 16 pulses for twin A before their family relocated and was unable to continue follow-up.

## DISCUSSION

The FPD is the treatment of choice for portwine stains in children [2]. The treatment of

thick hemangiomas is more difficult due to the limited depth of penetration of the FPD of 1.2 mm. It is unclear whether the eradication of the superficial component of a hemangioma will prevent proliferation of any deeper component [2].

An expectant approach to hemangiomas can be taken because the natural history of most lesions is that of a proliferative phase followed by an interim period of inactivity terminating with the involutational phase. In general, the literature reports that 50%–65% of hemangiomas involute by age 5 years, 75% by 7 years, and 90% by 9 years. It should be noted, however, that rarely a given lesion may not complete this process until several years later than these generalizations and that involution may be only partial (i.e., lip hemangiomas). Of involuted lesions, 10–20% will have lasting residual skin changes, which may include but are not limited to telangiectasia, redundant skin, scarring, and substantial fibrofatty tissue [2]. We began treatment early in the course of the hemangiomas' proliferation because thinner lesions are more responsive and there is some evidence that earlier involution will result in a better cosmetic outcome. Finn et al. [3] found that 80% of hemangiomas that involute after age 6 will leave residual scar, redundant skin, or telangiectasia. This figure drops to 38% for lesions involuting before age 6. The issue of psychological trauma suffered by children with hemangiomas is often underplayed. Timely intervention at an early age may spare the child this trauma [4].

Early treatment with FPD therapy may prevent progression, at least in some patients, and accelerated regression may be initiated in more advanced lesions [5]. Landthaler et al. [5] treated 29 patients with superficial hemangiomas and eight mixed type with FPD and obtained good results in nearly 60% of superficial and 40% of mixed hemangiomas. All of their patients demonstrated some diminution in size and color without ill effects, and they concluded that FPD causes involution at an earlier age than would normally be expected. Garden et al. [6] prospectively studied 24 infants and concluded that FPD may successfully prevent enlargement and promote involution of capillary hemangiomas with minimal adverse effects. Barlow et al. [7] treated seven patients with hemangiomas <12 months of age with FPD, and all lesions showed significant reduction in size together with improvement in skin color and integrity. FPD appears to be safe for the treatment of cutaneous vascular lesions in infants and children [8,9].

Twin A's nasal tip hemangioma continued to proliferate despite FPD treatment, most likely due to the thickness of the lesion. A course of oral steroids was planned shortly before the family relocated.

Twin B developed ulcerated hemangiomas which responded to FPD. It appears that laser treatment may speed up the rate at which flat, ulcerating lesions heal [10]. Morelli [1] reported treating 36 infants with ulcerated hemangiomas with FPD and found it to reduce healing time to one to three weeks.

It is interesting that hemangiomas developed in both Twin A and Twin B. It is unknown whether they are monozygotic or dizygotic twins. Two cases of monozygotic twins with a nevus flammeus in only one twin support that embryological mishap rather than genetic transmission is responsible for nevus flammeus [11]. Neonatal cutaneous hemangiomas in both identical twins have been reported [12]. It is unknown whether the occurrence of hemangiomas in identical twins is due to chance, environmental factors in utero, or embryological mishap occurring before splitting of the zygote.

To our knowledge, our patients are the youngest reported to be treated with FPD at age 30 days preterm. A 2-week-old infant had been reported to respond to treatment with few side effects [1]. Our patients were treated with a fluence of 4.5–6.25 J/cm<sup>2</sup> and a spot size of 7 mm, which was achieved posttreatment purpura, minimal blistering, and regression of some of the lesions. Because preterm infant's skin is thinner than term infants, lower fluences were effective. Some of their hemangiomas responded and no significant adverse effects were encountered. More prospective trials are needed to determine whether early treatment with FPD accelerates regression of hemangiomas or results in a better cosmetic outcome than expectant treatment.

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